

March 27, 2014

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PUBLIC SERVICE  
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Kyle Willard  
Director of Engineering  
Kentucky Public Service Commission  
PO Box 615  
Frankfort, KY 40602

Mr. Willard,

Please find enclosed Blue Grass Energy's 2013 Annual Reliability Report and 2014 Vegetation Management Plan.

If you have any questions, please feel free to contact me at (859) 885-2114 or [chrisb@bgenergy.com](mailto:chrisb@bgenergy.com).

Sincerely,



Chris Brewer  
Blue Grass Energy  
Vice President Power Delivery

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## Electric Distribution Utility Annual Reliability Report

### SECTION 1: CONTACT INFORMATION

UTILITY NAME	1.1	<u>Blue Grass Energy</u>
REPORT PREPARED BY	1.2	<u>Chris Brewer</u>
E-MAIL ADDRESS OF PREPARER	1.3	<u>chrisb@bgenergy.com</u>
PHONE NUMBER OF PREPARER	1.4	<u>859-885-2114</u>

### SECTION 2: REPORT YEAR

CALENDAR YEAR OF REPORT	2.1	<u>2013</u>
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### SECTION 3: MAJOR EVENT DAYS

TMED	3.1	<u>12.25</u>
FIRST DATE USED TO DETERMINE TMED	3.2	<u>1/1/2013</u>
LAST DATE USED TO DETERMINE TMED	3.3	<u>12/31/2013</u>
NUMBER OF MED IN REPORT YEAR	3.4	<u>1</u>

NOTE: Per IEEE 1366 TMED should be calculated using the daily SAIDI values for the five prior years. If five years of data are not available, then utilities should use what is available until five years are accumulated.

### SECTION 4: SYSTEM RELIABILITY RESULTS

Excluding MED

SAIDI	4.1	<u>110.51</u>
SAIFI	4.2	<u>1.01</u>
CAIDI	4.3	<u>109.12</u>

Including MED (Optional)

SAIDI	4.4	<u>140.68</u>
SAIFI	4.5	<u>1.14</u>
CAIDI	4.6	<u>123.46</u>

#### Notes:

- 1) All duration indices (SAIDI, CAIDI) are to be reported in units of minutes.
- 2) Reports are due on the first business day of April of each year
- 3) Reports cover the calendar year ending in the December before the reports are due.
- 4) IEEE 1366 (latest version) is used to define SAIDI, SAIFI, CAIDI, and TMED

# Electric Distribution Utility Annual Reliability Report

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## SECTION 5: OUTAGE CAUSE CATEGORIES

Excluding MED

CAUSE CODE DESCRIPTION		SAIDI VALUE	CAUSE CODE DESCRIPTION		SAIFI VALUE
Wind-not trees	5.1.1	25.13	Power Supplier	5.2.1	0.161
Lightning	5.1.2	14.88	Lightning	5.2.2	0.143
Equipment Fault	5.1.3	14.73	Equipment Fault	5.2.3	0.142
Power Supplier	5.1.4	10.90	Wind-not trees	5.2.4	0.118
Trees - Non ROW	5.1.5	10.15	Public Accident	5.2.5	0.073
Trees - ROW	5.1.6	6.97	Trees - ROW	5.2.6	0.059
Public Accident	5.1.7	6.65	Trees - Non ROW	5.2.7	0.057
Deterioration	5.1.8	5.58	Unknown	5.2.8	0.055
Unknown	5.1.9	4.54	Small Animal S.C.	5.2.9	0.053
Small Animal S.C.	5.1.10	3.86	Deterioration	5.2.10	0.050

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## SECTION 6: WORST PERFORMING CIRCUITS

CIRCUIT IDENTIFIER		SAIDI VALUE	MAJOR OUTAGE CATEGORY
West Berea 114	6.1.1	912	Equipment Fault
Lees Lick 134	6.1.2	526	Wind-not trees
Bridgeport 114	6.1.3	462	Wind-not trees
Jacksonville 124	6.1.4	401	Trees - Non ROW
Bridgeport 124	6.1.5	281	Wind-not trees
Cynthiana 154	6.1.6	281	Deterioration
VanArsdell 144	6.1.7	263	Small Animal S.C.
Newby 114	6.1.8	250	Equipment Fault
North Madison 114	6.1.9	226	Wind-not trees
Newby 154	6.1.10	218	Lightning

CIRCUIT IDENTIFIER		SAIFI VALUE	MAJOR OUTAGE CATEGORY
Bridgeport 114	6.2.1	0.050	Wind-not trees
Lees Lick 134	6.2.2	0.042	Wind-not trees
Ninevah 134	6.2.3	0.040	Public Accident
Cynthiana 114	6.2.4	0.039	Power Supplier
Bridgeport 144	6.2.5	0.025	Wind-not trees
Cynthiana 154	6.2.6	0.025	Deterioration
Fayette 1 164	6.2.7	0.025	Public Accident
Bridgeport 124	6.2.8	0.022	Wind-not trees
Jacksonville 114	6.2.9	0.021	Lightning
Holloway 124	6.2.10	0.018	Public Accident

**Blue Grass Energy**

	SAIDI					CAIDI	SAIFI
	All	MED	PS	Sched	Other	All	All
2001	111.5	23.7	1.6	2.1	84.1	83.0	1.34
2002	156.7	33.0	16.4	0.9	106.4	105.6	1.48
2003	1133.2	1033.4	8.4	0.9	90.5	504.5	2.25
2004	310.9	162.0	43.8	0.4	104.7	158.8	1.96
2005	108.6	0.0	15.9	0.7	92.0	91.1	1.19
2006	124.4	0.0	0.6	2.5	121.2	113.5	1.10
2007	147.1	41.5	6.4	2.9	96.4	120.2	1.22
2008	169.4	67.3	11.8	1.1	89.2	141.3	1.20
2009	2175.1	2068.1	5.2	4.2	97.7	1205.3	1.80
2010	133.9	15.3	21.4	0.8	96.5	108.1	1.24
2011	162.8	41.5	23.2	0.5	97.5	111.8	1.46
2012	510.2	394.9	15.5	2.0	97.9	261.8	1.95
2013	140.7	30.2	10.9	1.6	98.0	123.5	1.14
2003-2007 avg.	364.8	247.4	15.0	1.5	101.0	197.6	1.54
2004-2008 avg.	172.1	54.1	15.7	1.5	100.7	125.0	1.33
2005-2009 avg.	544.9	435.4	8.0	2.3	99.3	334.3	1.30
2006-2010 avg.	550.0	438.4	9.1	2.3	100.2	337.7	1.31
2007-2011 avg.	557.7	446.7	13.6	1.9	95.4	337.3	1.39
2008-2012 avg.	630.3	517.4	15.4	1.7	95.7	365.7	1.53
2009-2013 avg.	624.5	510.0	15.2	1.8	97.5	362.1	1.52

**Major Event Days**

2008	2009	2010	2011	2012	2013
2/6/2008	1/27-2/03/0	40325	5/25/2011	3/5/2012	12/21/2013
6/10/2008	2/11/2009			7/1-2/2012	
	39941			7/27/2012	
	39975			12/29-31/2012	

**Years over which data used**

Year T <sub>MED</sub> used for	T <sub>MED</sub>
2000-2004	2005 10.61
2001-2005	2006 11.40
2002-2006	2007 12.69
2003-2007	2008 12.09
2004-2008	2009 10.74
2005-2009	2010 11.50
2006-2010	2011 11.46
2007-2011	2012 11.26
2008-2012	2013 12.25
2009-2013	2014 11.65



# **DISTRIBUTION RIGHT-OF-WAY VEGETATION MANAGEMENT 2014 PLAN/ 2013 PLAN REVIEW**

**March 2014**

# Blue Grass Energy Vegetation Management Plan

## 2013 Review of Plan Implementation

Blue Grass Energy developed a formal plan to manage the maintenance of vegetation on distribution rights-of-way (ROW) in 2007/2008. The plans goals were established to provide excellent member service, maintain current tree related reliability, and look for opportunities to increase production and reduce program cost. These plans were continued and improved into 2013.

As stated in the previously submitted Vegetation Management Plan, the plan may be modified from time-to-time based on performance as measured by tree-related service reliability and evaluations of member satisfaction with service reliability. Specific reliability metrics may include Tree SAIFI, trends in customer minutes interrupted by tree-related causes and tree-caused primary interruptions per 100 line miles as internal benchmarks of program performance over time. A Tree-Caused Outage Report summarizes these reliability criteria and is regularly reviewed and monitored daily. Upon reporting of tree related outages a field investigation is conducted to determine the root cause.

## 2011-2014 Vegetation Management Strategy

### SCHEDULED MAINTENANCE AND CLEARANCE

Blue Grass Energy provides electric service to over 55,000 members through a network of over 4,500 miles of distribution line. Blue Grass Energy uses a cyclic approach to preventive electric distribution ROW. Different circuits or portions of circuits may be scheduled on different cycles based on site conditions, sensitivity of the line to interruptions caused by trees or criticality of the line. The maintenance cycle for tree removal, tree pruning or brush control may be the same or different for a given scheduling unit.

As illustrated in Table 1, Blue Grass Energy completed 15 distribution circuits scheduled in 2013 as well as 9 circuits carried over from 2012, for a total of 901 miles of distribution line completed in 2013. In 2014, there are 25 distribution circuits, for a total of 777.48 miles scheduled for completion in 2014. The varying site conditions determine the cost and cause completed miles to vary by year.

Table 1. Blue Grass Energy R/W Miles Scheduled vs. Completed

Maintenance Year	2011	2012	2013	2014
Scheduled	874	893	908	777
Completed	842	761	901	TBD

## **RELIABILITY**

In 2008, Blue Grass Energy developed and implemented an outage investigation process to better understand the cause of tree failures. The data was again used in 2013 to identify species failure rates and help plan future scheduled and non scheduled work to eliminate potential outages. The investigation of all tree related outages will continue through 2014 to collect data on major outage categories.

Historical Blue Grass Energy tree caused outages within the right of way are illustrated in Table 2.

**Table 2. Number of Tree-Caused Outages within the ROW on the Blue Grass Energy System**

<b>Year</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
<b>TOTALS</b>	<b>157</b>	<b>121</b>	<b>68</b>	<b>67</b>	<b>65</b>

## **2013 VEGETATION MANAGEMENT PLAN REVIEW**

Changes were implemented in 2013 to improve the ROW management plan. The “Distribution Right-Of-Way Vegetation Management Plan” submitted March 2013 reiterated in detail the processes that were built into the plan.

In 2013, all scheduled mileage and the 132 miles carried over from 2012 was completed within the 2013 calendar year.

Listed below are some of the processes used in 2013:

1. Continuation of Formal Contractor Evaluation Program. Each contractor will be rated on nine qualitative categories such as customer complaints, quarterly mileage goals, exceptions/ omissions, quality/standards, tools/equipment, unscheduled interruptions/OSHA LWD, contractor cooperation & communication, crew professionalism, and data accuracy.
2. Yearly Revision of formal program policies and procedures and assurance of consistent implementation throughout the system to include additional detailed requirements.
3. Continued yearly revision of a general 5-6 year maintenance cycle for the system based on collected field data. In areas where standard clearances cannot be consistently achieved (e.g., subdivisions), mid cycle assessments will be conducted and cycles adjusted based on those findings. Recommended cycle lengths are guidelines.
4. ISA Certified Arborist Utility Specialist supervisory personnel have adequate utility vegetation management technical expertise and a qualified ISA Certified Assistant Arborist is on staff.
5. Selective use of herbicides to control resprouting from the stumps of removed deciduous trees.
6. Written notification of property owners of the intent to prune trees and requirement of written permission for “yard” tree removals. We always strive to not allow property owners to influence pruning clearances.
7. The crew labor and equipment complements were adjusted throughout the year to maximize cost effectiveness.
8. Revised and improved the formal work monitoring and completion process. Each circuit is individually and 100 percent audited by ROW supervisory personnel to ensure specifications for clearance and quality are achieved.

9. Records were maintained of key aspects of the ROW vegetation management program to document program performance. This data provides information necessary for ongoing program management and circuit scheduling.

#### **2014 VEGETATION MANAGEMENT PLAN**

In addition to continuing the Distribution Right-Of-Way Vegetation Management Plans outlined for 2013 we intend to utilize the following key objectives in the upcoming year:

- Continue Formal Crew Field Audit Evaluation process, at the 100 percent level
- Uphold National Arbor Day Tree Line USA standards
- Continue to uphold ANSI A300 pruning and Z133 safety standards
- Utilization of vegetation management Best Management Practices as defined by the International Society of Arboriculture.
- Continue to evaluate and increase production and quality with established and new workforces
- Further inspection and reduction of unnecessary reactive maintenance
- Utilize multiple ROW vegetation maintenance contractors
- Re-establish a formal herbicide spray program to control woody species following maintenance pruning.

# Appendix

## ROW VEGETATION MAINTENANCE CLEARANCE CYCLE SCHEDULING STRATEGY

The following table summarizes the Blue Grass Energy ROW vegetation maintenance scheduling strategy. Individual circuits may be accelerated or deferred based on assessment of field conditions and operating performance.

<b>Circuit Description</b>	<b>Primary Cycle Length (Years)</b>	<b>Mid-cycle Inspection/selective Tree Maintenance (Years)</b>
Feeder Multi-phase	5-6	2 to 3
Feeder Laterals (single-phase)	5-6	
Industrial Circuits	5-6	Annual inspection and selective maintenance